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Caspian sea. It is a brownish-black, sticky mass, almost entirely soluble in boiling benzine. On extracting it with ether, a hard residue remains, which contains a paraffine whose melting point is 79°, and sp. gr. 0.939. This paraffine forms lustrous crystals and is very stable. It has been named *leken.*——*Celestite* has been found in three localities in Kansas, as announced by W. Knaus in the *Kansas City Review.*——A remarkably fine group of Japanese *stibnite* crystals has been recently purchased for the British Museum. The group consists of 120 crystals from one-half to two and a-half inches wide and thirteen inches long, the whole weighing 150 lbs.——Lippitt has found a native ferrous and aluminum sulphate from Mexico, which was a compact mass of flexible fibers resembling asbestos, of a greenish-white color and silky luster, with a hardness of 2 and spec. grav. 1.89. It was soluble in water, and analysis indicated that it corresponded to a mixture of two molecules of halotrichite and one of melanterite. The iron was all in the ferrous condition.——*Vivianite* occurs in brilliant, dark-blue crystals in the cavities of human bones taken out of a supposed Roman well near the pyrites mines of Rio Tinto, Sierra Morena.——Professor M. F. Heddle has found *topaz* associated with thorite, magnetite, amazon-stones, etc., in the syenite of Ben Loyal, Sutherland, Scotland.——*Idocrase* of a greenish-yellow color, and of unusually interesting crystallographic form, occurs at Kedabék, in the Caucasus, according to O. Korn. It has been shown by Jannasch that the idocrase from Vesuvius, Norway and elsewhere contains one per cent or more of fluorine.

BOTANY.[1]

GLANDS ON A GRASS.—In the latter part of August, 1883, while collecting various plants, my attention was attracted by some minute insects which appeared to be held fast to parts of the slender pedicels of one of our drop-seed grasses (*Sporobolus heterolepis*). An examination, by means of a hand-lens, showed these unfortunate insects to be adhering to small, dark-colored glistening swellings of the pedicels. Further examination showed these swellings upon most of the pedicels, and their slight stickiness to the touch quickly suggested their glandular nature. They were accordingly taken to the laboratory and carefully studied.

Upon making a cross-section of the swelling, the glandular tissue (*a*) was found to be disposed upon two sides of the section, with green tissue (*b*), and the fibrovascular bundles (*c d d*) and their accompanying masses of fibrous tissue (*e e*) occupying the remaining and interior parts, as shown in Fig. 1, of the accompanying camera sketches.

A higher power of the microscope showed the glandular tissue to be made of columnar radially-placed cells, which, from their relation to the contiguous tissues, are clearly to be regarded as modified epidermal cells. They were filled with minutely glandular contents (Figs. 2 and 3, *a*) of a faint amber color. Beneath the gland-cells there are several layers of chlorophyll-bearing cells (*b*).

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[1] **Edited by PROF. C. E. BESSEY, Ames, Iowa.**

A superficial view of the gland-cells showed them to be irregularly prismatic (Fig. 4). The outer walls are much thickened, as are also the lateral walls for some distance from the surface, these becoming gradually thinner as they pass inward, as shown in Figs. 2 and 3. For comparison, a superficial view of the ordinary epidermal cells of the pedicel, taken just above the glandular swelling, is here reproduced in Fig. 5.

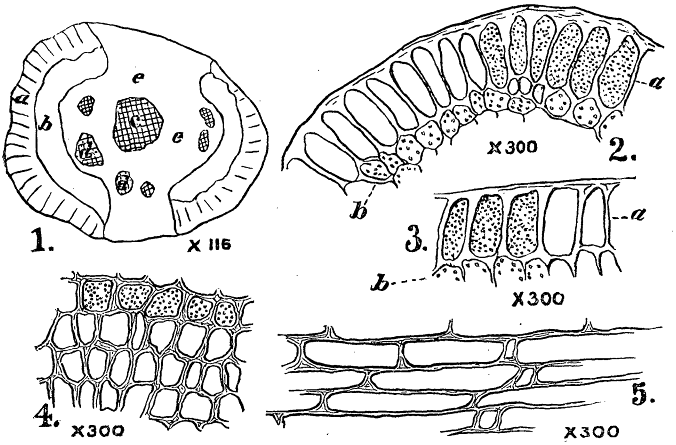


FIG. 1.—A cross-section of a glandular swelling; *a*, gland cells; *b*, green cells; *c*, and *d*, fibrovascular bundles; *e*, fibrous tissues. FIG. 2.—Cross-section of gland cells, *a*, and green cells, *b*. FIG. 3.—Longitudinal radial section of same. FIG. 4.—Superficial view of gland cells. FIG. 5.—Superficial view of ordinary epidermal cells of the pedicel, taken just above the glandular swelling. From camera lucida sketches.

These glands remind one, in their position, of the sticky belts upon the pedicels of certain species of Catchfly (*Silene*) and one is tempted to ask whether they have not the same functions in both cases.—*C. E. Bessey.*

SEXUALITY IN ZYGNEMACEÆ.—A paper was read [before the Linnean Society, Nov. 15, 1883] by Mr. A. W. Bennett, on the reproduction of the Zygnemaceæ, as a solution of the question—Is it a sexual character? De Bary, twenty-five years ago, and since then, Wittrock, have instanced what they have deemed sexual differences between the conjugating cells, though most later writers rather ignore essential physiological distinctions. Mr. Bennett has directed his investigations chiefly to the genera Spirogyra and Zygnema, and from these he supports the inference of the above-mentioned authors. He finds there is an appreciable difference of length and diameter in the conjugating cells, that deemed the female being the larger. The protoplasmic contents he also finds pass only in one direction, and change first commences in the chlorophyll-bands of the supposed male cells with accompanying contraction of the protoplasmic material. The genera Mesocarpus, Staurospermum, and the doubtful form Craterospermum have likewise been examined, and, though showing differences, yet on the whole substantiate the view above enunciated of cell sexuality."—*Nature.*

[In the case of hybridism in Spirogyra, described in the January NATURALIST, there were resting-spores in *both filaments.* The cell *A*, of the figure there given, was in the case of hybridism, functionally the male, but the next cell to the right contained a resting-spore, as is shown in the figure. Moreover, the right cell to the left of *B* [not shown in the figure] contained a resting-spore. This case would indicate that bi-sexuality must be confined in *A*, at least to individual cells, otherwise, we should have to consider this a case of conjugation between two female plants, which is manifestly absurd.—*C. E. Bessey.*]

SOME RECENT BOTANICAL ADVANCES.—Among the most significant of the recent discoveries in botany is that respecting the continuity of the protoplasm from cell to cell by means of delicate threads which traverse channels through the cell walls. It had long been known, that in the "sieve" tissues of higher plants there was such continuity through the "sieve plates," which imperfectly separated the contiguous cells. This may be readily seen by making longitudinal sections of a fibro-vascular bundle of a pumpkin stem, staining with iodine, and contracting the protoplasm by alcohol. Carefully made specimens of the soft tissues of many plants have shown a similar protoplasmic continuity, where it had previously been unsuspected. Some investigators are now inclined to the opinion, that protoplasmic continuity may be of universal occurrence in plants.

Tschirch regards it as probable, that Chlorophyll plays "not merely a physical, but also a chemical part in the process of assimilation." This is in opposition to Pringsheim's view, that the function of chlorophyll is that of a screen or shade.

It has recently been suggested that the act of sexual conjugation, that is, the union of two masses of protoplasm, may be regarded as "simply a strongly specialized instance of the absorption of nutriment." According to this view, what we call fertilization, is but the feeding of a cell upon the richest possible food, *i. e.*, material identical with its own substance. This rich food enables the cell, so greatly nourished, to perform the work of reproducing a new individual.

BOTANY IN A MEDICAL COURSE.—From *Nature* we learn that a most excellent course of study in botany is required in medicine, in England, as indicated by the examinations under the new rules which took effect in January of this year. These examinations "will have reference to the fundamental facts and laws of the morphology, histology, physiology, and life-history of plants, as illustrated by the following types: Saccharomyces, Protococcus, Mucor, Spirogyra, Chara or Nitella, a Fern, Pinus, and an angiospermous flowering plant."

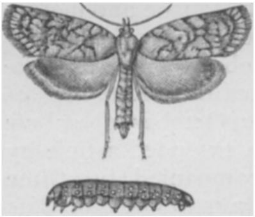
Is there any medical school in this country, where such an intelligently arranged course in elementary botany is provided? Too often, alas, there is no *botany at all* in our medical courses.

OBITUARY.—The friends of science, and mycologists especially, will learn with regret of the death of Wm. T. Haines, Esq., who died suddenly at his residence in West Chester, Pa., on the 2d of February, 1884. Mr. Haines, in addition to his arduous legal duties, has for many years taken a deep interest in scientific pursuits, and especially in the investigation of the flora of his locality; and the many interesting species contributed to the North American Fungi, by him and his colleagues of the West Chester Mycological Club, will long keep his name in pleasant remembrance among those who turn over the pages of that collection.—*J. B. Ellis.*

BOTANICAL NOTES.—A fine engraving of the foliage and mature cones of *Dammara australis*, the Kauri Pine of New Zealand, is given in the *Gardener's Chronicle*, for October 27th, last. The number for November 3d, contains well-drawn life-size figures of our Yellow-water lily (*Nuphar advena*).—The October *Quarterly Journal of Microscopical Science*, contains an extended article by H. M. Ward, on the genus Pythium, accompanied by three double-page plates. We hope to present a summary of this paper ere long.——A proposal has been made in England to celebrate the bi-centenary of the discovery of bacteria (by Leeuwenhoek, in 1683), by the endowment of a National laboratory of hygiene, in which the study of the bacteria shall be one of the principal objects.——In the January *Torrey Bulletin*, Mr. Schrenk contributes some notes on Tuckahoe, accompanied by a plate. The evidence now adduced seems to indicate that tuckahoe is due to a sort of gummy degeneration of the tissues of some plant, and that the fungal threads present are saprophytic; the accompaniment not the cause.——In the same journal several new grasses are described by Mr. Scribner. One by Dr. Vasey, is dedicated to the well-known collector, A. H. Curtis. It is from Florida, and is named *Ammophila curtisii.*——The February *Botanical Gazette*, is an unusually interesting number, containing among other papers, one on Schweinitz (biographical), a Botanical Holiday in Nova Scotia, Notes on the N. A. forms of Podosphæra, Additions to the Habitats of N. A. Sphagna. The General and Editorial Notes are full, and well selected. Among these we notice the discovery of a grass, *Graphephorum festucaceum*, from Northern Iowa. It has hitherto been known only from the Saskatchewan region, northwestward to Alaska. This northern grass may well serve as a companion with *Adoxa moschatellina*, also a far northern plant found a few years since in Northern Iowa.——General Benjamin Alvord, publishes in the Bulletin of the Am. Geographical Society, No. 4, a valuable paper on Winter grazing in the Rocky Mountains. Its chief interest to us in this place is its discussion of the grasses of that region.——We fell into an error in our notice (in the February NATURALIST) of very simple prothallia of a fern (*Onoclea struthiopteris*) grown by D. H. Campbell. The autheridia were not one-celled, as we understood from the drawing and description, but several-celled.

ENTOMOLOGY.

THE SPRUCE-BUD TORTRIX.[1]—The habits of this insect while in confinement were first studied by Professor C. H. Fernald, of the Maine State Agricultural College, Orono, Me., and his account published in the AMERICAN NATURALIST for January, 1881. In the account of the ravages of a caterpillar on the spruces on the coast of Maine in Bulletin 7 of the United States Entomological Commission, we refer to this insect, which we were unable to identify, as, after repeated search in the latter part of the summer, we failed to discover any traces of the insect in any stages. In our account we gave greater prominence to the operations of borers and bark beetles than to those of this caterpillar; and while considerable damage was undoubtedly done to spruces and firs in Sagadahoc and Cumberland counties by those beetles, from farther inquiries and field-work carried on in June and July, 1883, in different parts of Maine, we now have little doubt but that the destruction of spruces and firs along the coast of the State was mainly due to the attacks of this insect.



The different climatic causes alleged to destroy forest trees in general, would, in the present case, have injured pines and hardwood trees, as well as spruces and firs, and the destruction would have been general; whereas the trees have been killed by a caterpillar which we have never found upon pines nor any trees but spruce, fir, and occasionally the hemlock and larch. Individual trees, or clumps of trees, were attacked, whether in high and exposed situations or in hollows; occasionally from such centers the worms seem to have increased and spread from year to year, until all the trees in localities several square miles in extent were killed. Moreover, as we have seen in the case of the attacks of

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[1] Extracted from the report of the Entomologist (Professor C. V. Riley) of the Department of Agriculture for 1883.